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Meridian Communications Adapter

M3902
M3903
M3904
M3905

User Guide

Enterprise Voice Solutions Customer Documentation

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Introduction

About the document

The Meridian Communications Adapter (MCA) is an interface that supports many desktop applications. This User Guide describes how to use the MCA to interface with these desktop applications and the Meridian 1.

This guide displays information pertaining to synchronous operation in italic type.

The Meridian Communications Adapter (MCA) passes *synchronous and* asynchronous data through Nortel Networks systems by using the M3900 Series Meridian Digital Telephone. The MCA supports Data Terminal Equipment; there is no way to configure the MCA for Data Communications Equipment, but a "null modem" adapter can be used to allow compatibility between Data Communications Equipment and the MCA.

MCA on the M3900 Series Meridian Digital Telephones works with Release 24 minimum.

Just as your phone has a unique directory number (extension), the MCA has a data directory number configured in the system.

Attached to the MCA via its RS-232 serial port is a dumb terminal or personal computer. The dumb terminal talks directly to the MCA. A personal computer uses special communications software to access the serial port. Examples of such software include Crosstalk, ProCom Plus, Reflections, and Smartcom. Serial printers may also be connected to the MCA.

Once a data call is established you can perform data communications through the M3900 Series Meridian Digital Telephone to a far end service, such as a mainframe, a modem pool, other personal computers, or printers.

The MCA uses EEPROM non-volatile read/write memory for permanent storage of settings and configuration parameters. In synchronous mode *Auto Dial and Speed Call numbers are stored within your Meridian 1 system.*

Note: The Meridian SL-100 does not support the MCA on the M3900 Series Meridian Digital Telephone.

Before you use the MCA

All M3900 telephones that are compatible with the MCA have a display. The display facilitates operating the data parameters from the telephone keypad.

The MCA is a cartridge accessory which inserts into the Accessory Connection Module on your M3900 Series Telephone. You must install the ACM into your

Introduction

M3900 series telephone.Once the ACM is installed, the MCA cartridge accessory is inserted into the ACM to provide an interface to data functions. To install the ACM refer to the Accessory Connection Module Installation Guide packaged with the ACM.

Use the following procedures to install the MCA to the telephone:

- Plug the MCA Accessory Cartridge into the ACM opening in the back of the telephone footstand.
- Plug the MCA transformer into the appropriate external electrical outlet (use only the transformer designed for your MCA).
- Connect the Adapter plug, attached to your transformer, into the wall jack.
- Connect the six conductor line cord from the telephone to the Adapter jack attached to your ATA transformer.
- Connect the MCA to the your data equipment.

For countries outside Canada, Japan and the US, separate purchase of a power supply cordset is necessary. Care should be taken to match the plugs on the cordset to the wall receptacle and the power supply. Be certain to select a safety certified cordset, compliant with local, regional and national installation codes.

CAUTION
Before handling internal telephone components, you must discharge static electricity from your hands and tools by touching any grounded metal surface or conductor.

Use the MCA to make data calls

Before you use the MCA to make data calls, do the following:

- Make sure the red LED on the MCA is blinking at a constant rate. This indicates the MCA has power and is ready for operation.
- Attach your terminal or PC serial port to the MCA 25 pin D connector via an RS-232 *or V.35 cable*.
- Make sure that your terminal or PC is powered up and ready to send data.
- If you are using a PC, make sure your communication software is running.

CAUTION
Use only the line cord provided with your Meridian M3900 Telephone when installing and removing options.

Dialing methods

The MCA provides three methods for making data calls through the Nortel Networks PBX: keyboard dialing, AT dialing, and keypad dialing. You use Keyboard and AT dialing by entering commands at a terminal or on a PC running software to make it emulate a terminal. Keypad dialing is done through the telephone keypad.

Keyboard dialing is menu driven. Data calls are made by pressing the < CR > to get the Main menu. By navigating through the menus, different features can be activated.

AT dialing is very similar to methods used to make modem calls with a Hayes Smartmodem[1]. The user enters a command starting with the letters AT followed by a few letters to distinguish the command, then presses the carriage return < CR > Key.

Keypad dialing on the M3900 telephone is done by pressing the Options Key followed by a two digit MCA data parameters number. To release the keypad telephone dialing, press the Options Key.

Switching between keyboard and AT dialing

To switch between AT dialing and keyboard dialing, you must be in an idle state (not connected to a far end data device).

The most recent prompt must be either:	**NO CARRIER** **or** **RELEASED**
To switch to AT dialing:	
AT	At this point you may type **AT** to get AT dialing
or	**or**
< CR >	Press the **Carriage Return** Key to activate keyboard dialing.

1. Smartmodem is a trademark of Hayes Microcomputer Products Inc.

Make a data call

The procedures in this section describes how to make basic data calls. There are three methods used to make a data call; keyboard dialing, AT dialing and keypad dialing.

Note: Throughout this guide, **<CR>** refers to a **Carriage Return**.

Keyboard dialing

<CR>	1. Press the **Carriage Return**. **ENTER NUMBER OR H (FOR HELP)**
# **and <CR>**	2. Enter the **number** of the far end data device and Press the **Carriage Return** <CR>. **CALL CONNECTED SESSION STARTS**
<CR>	3. Press the **Carriage Return**. Follow normal procedures to login and use the data service.

AT dialing

AT dialing is used in conjunction with your personal computer. To use AT dialing follow these instructions:

AT + <CR>	1. Enter **AT** and press the **Carriage Return**. **OK**
ATDxxxx	2. Enter the **ATDxxxx** (where xxxx is the number of the far end data device).
<CR>	3. Press the **Carriage Return**. **CONNECT**
<CR>	4. Press the **Carriage Return**. Follow the normal procedures to login and use the data service.

Keypad dialing

Keypad dialing is accessed through the Options. Press the Options Key and use the Navigation Keys to scroll to MCA data parameters. Once you are familiar with your MCA option number, you can press the Options key and dial the MCA data parameters option number, followed by the parameter number.

- The Options Key on the M3902 is on the right side of the telephone.
- The Options Key on the M3903 and M3904 is on the front edge of the telephone.
- The Options Key on the M3905 is a Programmable Line/Feature Key (self-labeled) located at the left side of the upper portion of the display area.

If you know the MCA data parameter number:

1. Press the **Options** Key

2. **Dial** the number on the telephone keypad. Your telephone display shows

   MDIAL

   ENTER DIGITS Options EXIT

3. **Dial** the number of the far end data device. The display prompts (if call is successful)

   DATA CALL CONNECTED

   The terminal prompts

   CALL CONNECTED.SESSION STARTS

<CR>

4. Press the **Carriage Return**.

   Follow normal procedures to login and use the data service.

Release a data call

To release a call while in asynchronous mode, use any of the following methods:

Press the **Break** Key(s) on your PC keyboard for 1.6 seconds or longer.

Note: This method is not supported on terminals with non-overlapping timed break.

Press the **Break** Key(s) on the PC Keyboard three times in quick succession. The break must be at least 100 milliseconds and all three breaks must be within one second.

or

or

+ * or

Press the **Options** Key on the telephone and dial the **Asterisk** Key

or

Drop DTR (Data Terminal Ready).

Note: To drop DTR you need a programmable F-Key designated as DTR.

Note: DTR can drop on its own and in this case, the MCA connection automatically drops.

Note: If the far end data device releases the call, the MCA automatically drops its end.

Release a synchronous call using one of these methods:

+ *

*Press the **Options** Key on your telephone and dial the **Asterisk** Key*

When a data call is disconnected, the terminal displays the following:

RELEASED

or

NO CARRIER (AT dialing mode)

Default parameters for Asynchronous and Synchronous

The MCA is configured in asynchronous mode when it is shipped from the factory.

The MCA defaults to synchronous or asynchronous mode from the telephone. The mode is determined prior to resetting the parameters. Listed here are the default parameters. The mode is determined prior to resetting the parameters. Refer to the "Reset data parameters" section in this guide for more information.

Asynchronous	Synchronous
Keyboard dialing	*Hot Line Off*
Autoanswer	*Autoanswer*
DTR OFF	*DTR OFF*
DCD ON	*DCD ON*
Baud rate 9600	*Baud rate 56000*
Hot Line OFF	*Virtual Leased Line OFF*
Remote Loopback	*Remote Loopback OFF*
Full duplex	*Full duplex*
Asset RTS ON	*PSDS OFF*
Space parity	*Internal clock*
Terminal mode	*Modem mode*
	SL-1 Mode
	V.25 bis OFF

Keyboard dialing menus

Main Menu

C — CALL
A — AUTO DIAL
P — DISPLAY PARAMETERS
CTRL-Z TO ABORT KEYBOARD DIALING
S — SPEED CALL
M — MODIFY
D — SCRIPT FILE DIRECTORY

Script File Menu

L — LEARN SCRIPT
D — DELETE SCRIPT
SELECT:

E —ESCAPE CODE
Q — QUIT SCRIPT MENU

Modify Menu

A — AUTO NUMBER
S — SPEED NUMBER
R — REMOTE LOOPBACK
SELECT:

M — MANUAL ANSWER
F — SCRIPT FILE
Q — QUIT MODIFY

Learn Script Menu

A — LEARN AUTO DIAL SCRIPT
S — LEARN SPEED SCRIPT
SELECT:

D — SCRIPT FILE DIRECTORY
Q — QUIT LEARN MENU

Keyboard dialing

This chapter explains the keyboard dialing commands and how to use them. You can enhance your data call dialing by using features such as Speed Call and file scripting.

Keyboard dialing is menu-driven. See Figure 1 for menus. Use them as a reference when following procedures.

Each procedure in this chapter assumes you are beginning at the initial prompt of

ENTER NUMBER OR H (FOR HELP):

To get the initial prompt, hold down the break key(s) for at least 1.6 seconds and press the carriage return (<CR>). This will release a current data call if you are on one.

Abort current command

To abort the current command:

Ctrl + Z

<CR>

1. Press the **Control** Key and press the **Z** Key.

   RELEASED

2. Press the **Carriage Return**.

   ENTER NUMBER OR H (FOR HELP)

Note: This command will not work during an active data call. First you must release the call.

Auto Dial

To use Auto Dial:

A <CR>

1. Select **A** (Auto Dial) and press the **Carriage Return**.

   CALLING

To define (change):

M <CR>

2. Select **M** (Modify) and press the **Carriage Return**.

Terminal displays Modify menu.

A <CR>

3. Select **A** (Auto Number) and press the **Carriage Return**.

   AUTO DIAL NO.

XX <CR>

4. Enter the **Auto Dial** number and press the **Carriage Return**.

Speed Call

To use Speed Call:

S <CR>

1. Select **S** (Speed call) and press the **Carriage Return**.

   ENTER ACCESS CODE

XX <CR>

2. Enter **access code** (Speed call code) and press the **Carriage Return**.

   CALLING

To define (change):

M <CR>

1. Select **M** (modify) and press the **Carriage Return**.

Terminal displays Modify menu.

S <CR>

2. Select **S** (Speed Number) and press **the Carriage Return.**

   ENTER ACCESS CODE

XX <CR>

3. Enter **access code** (Speed Call code) of the number you wish to define or change. It can be one, two, or three digits.

   ENTER NUMBER: xxx

   (xxx = access code)

XXXX <CR>

4. Enter **extension number** (DN) to be represented by the access code, and press the **Carriage Return**.

Script File

To use Script File:

script name **<CR>**

Enter **script name** and press the **Carriage Return**.

The MCA will connect to the far end data device and the script will be executed automatically. The MCA will follow the same steps you took when writing the script. It works like a macro file.

To define the Script File:

M **<CR>**

1. Select **M** (Modify) and press the **Carriage Return**.

Terminal displays **Modify menu**.

F **<CR>**

2. Select **F** (Script File) and press the **Carriage Return**.

Terminal displays **Script File menu**.

L **<CR>**

3. Select **L** (Learn Script) and press the **Carriage Return**.

Terminal displays **Learn Script menu**.

A **<CR>**

4. Select **A** (Learn Auto Dial script) and press the **Carriage Return**.
   or

S **<CR>** **XX**

Select **S** (Learn Speed Call script) and press the **Carriage Return**. Enter Speed Call code at prompt

ENTER ACCESS CODE

<CR>

5. Press the **Carriage Return**.

ACTIVATE LEARN MODE? (Y/N)

Y **<CR>**

6. Select **Y** and press the **Carriage Return**.

ENTER SCRIPT NAME

Name <CR>

7. Enter the **name** you want to call the script by and press the **Carriage Return**.

   ESCAPE CODE =[+] MODIFY (Y/N)

   (+ = escape code key symbol)

N <CR>

8. Select **N** and press the **Carriage Return**.

Terminal displays `Main menu`.

Esc Esc <CR>

9. Make a data call, following the exact procedure you wish the script to remember. Press the Escape Key twice (see page 14) to enter privacy mode for password protection. Press the **Carriage Return** <CR> to exit privacy mode.

Esc Esc Esc

10. When you wish to end the script, press the Escape Key three times in quick succession.

11. Release the data call and immediately place an Auto Dial or Speed Call for which the Learn Script process was set up. At this point the script is saved.

Script File directory

To view a list of your script files:

D and <CR>

1. Select **D** (Script File directory) and press the **Carriage Return**.

Your terminal lists the script file names and length in bytes, plus each script's associated speed call access code (an A in the access code column stands for the Auto Dial script). See the example:

SCRIPT FILE DIRECTORY

ACCESS CODE	SCRIPT NAME	LENGTH (BYTES)
A	EMAIL	262
21	MAINFRAME	455
33	DBASE	345

Delete Script File

<CR>

1. Select **M** (Modify) and press the **Carriage Return**.

Terminal displays `Modify menu`.

<CR>

2. Select **F** (Script File) and press the **Carriage Return**.

Terminal displays `Script File menu`.

<CR>

3. Select **D** (Delete Script File) and press the **Carriage Return**.

Terminal displays `Delete menu`.

<CR>

4. Select **A** (Auto Dial) and press the **Carriage Return**.
   or

<CR>

   Select **S** (Speed Call) and press the **Carriage Return**. Enter speed Call code at prompt:

   ENTER ACCESS CODE

   SCRIPT [script name] EXISTS DELETE? (Y/N)

<CR>

5. Select **Y** and press the **Carriage Return**.

   DELETING

Escape code

To change Escape code:

1. Select **M** (Modify) and press the **Carriage Return**.

Terminal displays **Modify menu**.

2. Select **F** (Script File) and press the **Carriage Return**.

Terminal displays **Script File menu**.

3. Select **E** (Escape Code) and press the **Carriage Return**.

ESCAPE CODE =[+] MODIFY (Y/N)

4. Select **Y** and press the **Carriage Return**.

ENTER ESCAPE CODE

5. Enter the new Escape code (can be a control character) and press the **Carriage Return**.

There are three uses for the Escape code character:

Note: A guard timer of one second distinguishes the escape sequences. In other words, one escape character is not interpreted as a pause until a full second elapses in which you do not enter another escape character.

— One **escape** character inserts a pause in a script file.

— Two **escape** characters puts you into privacy mode, useful for skipping part of a script file procedure for password protection.

<CR> — Press the **Carriage Return** to leave privacy mode.

Esc Esc Esc — Three **escape** characters saves a script file to the MCA EEPROM.

Manual answer (asynchronous)

M <CR>

1. Select **M** (Modify) and press the **Carriage Return**.

Terminal displays **Modify menu**.

M <CR>

2. Select **M** (Manual Answer) and press the **Carriage Return**.

MANUAL ANSWER (Y/N)

Y <CR>

3. Select **Y** and press the **Carriage Return**.

Incoming data calls will give you this prompt:

INCOMING CALL. ANSWER (Y/N)

If you respond Y to the prompt in step 2, an incoming data call will connect automatically and you will receive the prompt:

INCOMING CALL CONNECTED

Remote Loopback

To perform a remote loopback test:

M <CR>

1. Select **M** (Modify) and press the **Carriage Return**.

Terminal displays **Modify menu**.

R <CR>

2. Select **R** (Remote Loopback) and press the **Carriage Return**.

Remote loopback will be enabled for the next data call only. This feature is useful for diagnostic purposes.

Ring Again

When the far end number is busy you receive the prompt:

BUSY, RING AGAIN? (Y/N)

or

BUSY, PREVIOUS RING AGAIN ACTIVE, REPLACE? (Y/N)

Y <CR>

1. Select **Y** and press the **Carriage Return**. Ring Again is activated and notifies you when the far end is free.

   RING AGAIN PLACED

When the far end data device is free you receive the prompt:

DATA STATION NOWAVAILABLE, PLACE CALL (Y/N)

Y <CR>

2. Select **Y** and press the **Carriage Return**.

Note: You must answer Ring Again within 30 seconds after you are prompted or it cancels. You can only set Ring Again to monitor one busy line at a time.

Ring Again (synchronous)

Synchronous calls can only be made from the telephone keypad.

Display parameters (asynchronous)

To list information about MCA configuration from the terminal:

P <CR>

Select **P** (display parameters) and press the **Carriage Return**.

The following example shows the items listed with possible values for each.

The first three parameters give information on the current version MCA you have (they do not change).

For more detailed descriptions of these parameters, see Keypad dialing.

Engineering code = NT2K0047
Release = 01
Firmware = 3.5
Baud Rate = 19200
Parity = ODD
DTR = ON (Data Terminal Ready)
DCD = ON (Data Carrier Detect)
VLL = OFF (Virtual Leased Line)
Hotline = OFF
Remote Loopback = OFF
Manual Answer = OFF
Data Directory Number = 4000
Auto Dial No. = 3600

AT dialing

AT dialing is similar to the methods used to make data calls with a Hayes Smartmodem. Some AT commands do not apply to the MCA, and are not supported.

Most AT commands begin with the letters AT (not case sensitive). These two letters are followed by a one- or two-character command (sometimes followed by additional parameters) and a carriage return. Each command line is limited to a maximum of 40 characters (not including the AT and spaces).

You will not hear any tones when using AT dialing with the MCA.

Note: Remember that all of these commands (except A/ and the escape code) are followed by a carriage return).

If you don not include a numerical parameter with a command, the MCA assumes the parameter to be zero (0).

A/ (repeat last command)

This sequence repeats the last command you entered. It is not preceded by AT and not followed by carriage return.

ATA (answer)

This answers an incoming data call when the MCA is set for manual answer (S-register 0 = 0).

ATCn (carrier detect enable/disable, where n = 0, 1)

Carrier detect is enabled when n = 1, disabled when n = 0. When enabled, the carrier detect lead will be off until a data call has been established.

ATDxxxx (dial, where x = 0–9)

This performs a manual data call. The digits, xxxx, represent the phone number of the far end data device.

ATEn (echo, where n = 0, 1)

Commands do not echo back to your terminal when n = 0. Meaning, you do not see your commands, only their result. Commands will echo when n = 1.

ATOn (on-line, where n = 0, 1)

This will put you on-line if you had previously used the escape code (three escape characters) to go off-line. The same result applies to both case n = 0 and n = 1.

ATQn (result code, wheren=0,1)

Result codes (call progress prompts) are not sent to your terminal when n = 1. That is, you will not see call progress prompts. When n = 0 result codes are sent to your terminal.

ATV n (verbal result, where n = 0, 1)

Verbal prompts are sent to your terminal when n = 1. Numeric prompts are sent when n = 0. The following chart lists the result codes and their meaning.

Numeric	Verbal	Description
0	OK	Command was successful.
1	CONNECT	Far end has answered.
2	RING	Local end is ringing.
3	NO CARRIER	Call was released.
4	ERROR	Command line contains an error.
Extended codes:		
5	CONNECT 1200	1200 baud connection complete.
7	BUSY	Busy signal is detected.
10	CONNECT 2400	2400 baud connection complete.
11	CONNECT 4800	4800 baud connection complete.
14	CONNECT 19200	19200 baud connection complete.

ATXn (result code selection, where n = 0–4)

When n = 0, the MCA supports result codes 0–4. When n = 1 or 2, the MCA supports result codes 0–5, 10–12, and 14. When n = 3 or 4, the MCA supports result codes 0–5, 7, 10–12, and 14.

ATZn (soft reset, where n = 0, 1)

This returns S0 through S49 registers and AT configurations to their default settings. The same result applies to both case n = 0 and n = 1.

Registers S50 through S69 will be reset to their default values only upon power-up.

The following commands are extensions to AT dialing used to support the MCA.

ATDPxxxx (voice call, where x = 0–9)

This allows you to make a voice call from your terminal. The digits, xxxx, represent the number of the person you wish to call. S8 registers are not applicable. For example, a comma (pause) delays by one digit, and a maximum of 32 digits are allowed.

ATF3 (Handsfree/mute)

This allows you to mute your end of a Handsfree call, and repeat the command to toggle back to normal Handsfree operation.

ATF4 (Hold)

This puts an active voice call on hold.

ATF5 (Select)

This takes a voice call off hold (as if you pressed its DN key).

ATH0 (hang up data call)

This releases an active data call. You must first be off-line (hit three escape characters).

ATHP (hang up voice call)

This releases an active voice call, just as if you pressed the Release key on the phone.

ATTSP! (transparent mode)

You can display the raw signaling messages sent between the PBX and the MCA using this command. This mode is used by some special software applications.

ATIn (product identification code, where n = 0, 1, 4)

When n = 0, the MCA displays the contents of S-registers S52–S54. The default is "960" (Smartmodem V-series 9600 modem). Other possible values are: "122" (Smartmodem 1200) and "240" (Smartmodem 2400).

When n = 1, the result is "206."

When n = 4, the result is "a037800c004420" and then "b100000000" (these are the same values that Smartmodem V-series 9600 returns).

AT&Cn (carrier detect control, where n = 0, 1)

When n = 0, carrier detect lead is always asserted.

When n = 1, the carrier detect remains off except when the call is terminated.

AT&Dn (response to DTR, where n = 0–3)

When n = 0, the MCA ignores the status of DTR.

When n = 1, the MCA resumes the off-line command state when on-to-off transition of DTR occurs.

When n = 2, the MCA drops the call when on-to-off transition of DTR occurs.

When n = 3, the MCA hangs up when on-to-off transition of DTR occurs and returns its Hayes parameters to their default settings.

AT&Rn (clear-to-send options, where n = 0, 1)

When n = 0, the CTS lead remains off.

When n = 1, CTS is always present.

AT&Sn (data-set-ready options, where n = 0, 1)

When n = 1, the DSR lead is off.

When n = 0, DSR is always present.

AT&F (factory configuration profile)

This returns S0 through S49 registers and AT configurations to their default settings.

AT&Yn (recall user profile on power-up, where n = 0, 1)

This returns S0 through S49 registers and AT configurations to their default settings. The same result applies to both case n = 0 and n = 1.

Off-line mode

To enter the AT command state from the on-line data transfer state:

1. Press the **escape** character three times in quick succession.

ATH0

2. To return to a command mode (AT or keyboard dialing) while also dropping the call, use the break key(s). Enter **ATH0**.

ATO0 or ATO1

3. To return to on-line mode, enter **ATO0** or **ATO1**.

Note: While the MCA is learning a script (keyboard dialing), it will ignore the on-line escape sequence.

S-registers

S-registers are used to configure the MCA. Some S-registers do not apply to communication through a PBX, but are included for completeness.

ATSn=x

Enter ATSn when you wish to change and x is the new value. Where n is the number of the S-register (0–69).

ATSn?

Enter ATSn to return the value of the S-register in decimal. Where n is the number of the S-register (0–69).

S0 (number of rings incoming; range = 0–255)

Auto answer is disabled when n = 0. Any other value will be equal to the number of rings before an incoming data call is answered.

S1 (ring count; read only)

This returns the current number of rings for an incoming data call when read.

S2 (escape character; range = 0–255)

This holds the ASCII value of the escape character. If the S2 register is set to a value of 128 or greater, then escape character action is disabled.

S3 (carriage return character; range = 0–127)

This holds the ASCII value of the carriage return (used for command line termination and prompt termination). The default is 13.

S4 (line feed character; range = 0–127)

This holds the ASCII value of the line feed character. The default value is 10.

S5 (backspace character; range = 0–32, 127)

This holds the ASCII value of two values, one for the backspace key and one for the character echoed to move the cursor back one position.

S9 (carrier detect response time)

Not applicable.

S10 (lost carrier hand up delay)

Not applicable.

S11 (DTMF tone duration)

Not applicable.

S6 (waiting time before blind typing)

Not applicable.

S7 (wait time for carrier/dial tone; range = 1–255)

This holds the Carrier Detect time-out value. When the time (in seconds) elapses, the attempted call is released. The default value is 30 seconds.

S8 (pause time for comma; range = 0–255)

A comma included in the dialing sequence is interpreted as a delay. The default delay time is two seconds.

S12 (escape code guard time; range = 0–255)

The guard time aids in recognition of the escape sequence, useful since different numbers of escape characters mean different things. For example, one Escape character is not recognized as a pause until the guard timer expires, indicating no other Escape characters were entered as part of the Escape sequence.

This holds the value of the guard time in milliseconds. The value of each digit is 20 milliseconds. The default value is 50 (one second).

S52, S53, S54 (product code response)

These registers contain the Product Identification code and will output a three digit code in response to the "ATI0" command.

Default value is "960" (Smartmodem V-series 9600 modem). Other possible values are: "122" (Smartmodem 1200) and "240" (Smartmodem 2400). These registers will not be altered by software reset.

S66 (AT/KBD autobaud interpretation; range = 0, 1)

A value of zero (0) means only Hayes autobaud is possible. A value of one (1) means both Hayes and keyboard dialing autobaud is allowed.

S51 (delay until modem pool activation; range = 0–255)

Each increment of S51 represents a 0.25 second delay before outbound modem pool activation. Default is 16 (4 seconds). This register will not be altered by software reset.

Dial modifier

Dial modifiers are special parameters used to tell the MCA how to dial the data number.

Description	Modifier
Digit for dialing	0–9
Characters for dialing	A B C D
While dialing, instructs PBX to begin dialing the digits entered to this point. After dialing, this character is outpulsed as tone.	#
After dialing, this character is outpulsed as a tone.	*
Delay processing for a period of time, set by S8 register. Default is two seconds.	, (comma)
Return to command state after dialing.	; (semicolon)
You can use these characters while dialing but they have no effect in the dialing sequence.	!@ P R T W

Introduction to Keypad dialing

Keypad dialing can be used in both *synchronous and* asynchronous mode. The MCA data parameter *commands* accessed through the Options Key, require a Display on the telephone. Keypad dialing commands are most useful for making simple data calls or for modifying the MCA configuration. The M3902, M3903, M3904, and M3905 access the MCA data parameters through the Option Key.

- M3902 Option Key - one of the fixed key on the right side edge of telephone.
- M3903 and M3904 Option Key - one of the fixed keys on the bottom edge of the telephone.
- M3905 Option Key - is a Programmable Line/Feature Key (self-labeled) located on the right hand side of the upper portion of the telephone display area.

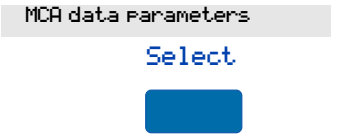
Keypad dialing

You can use the telephone keypad for voice calls or to operate the MCA, by using the Options Key.

General instruction for using Keypad dialing:

1. Pressing the **Options** Key.

2. Use the up and down **Navigation** Keys to scroll to MCA data parameters.



3. Press the **Select** Key.

4. Use the right and left **Navigation** Keys to scroll through the MCA data parameters sublist.

5. **Dial** the two digits listed for your data selection.

Note 1: When you have given a Keypad command to the MCA, it remains in that mode until you press the Options Key or Quit Key.

Note 2: You cannot make an outgoing call while in an active MCA command.

Note 3: You can receive calls while the MCA is performing an active command.

6. Press the **Options** Key

or

or
Press the **Quit** Key to end session.

Example: MCA data parameter Keypad dialing command for Ring Again:

Ring Again (*synchronous or* asynchronous)

1. *Press the **Options** Key.*

2. *Use the up and down **Navigation** Keys to scroll to the MCA data parameters.*

3. *Press the **Select** Key.*

4. *Use the right and left **Navigation** Keys to scroll through the sublist.*

5. ***Dial** the **number** next to the data parameter you choose, for Ring Again the number is **64**.*

When the called port is busy, the display on the telephone reads:

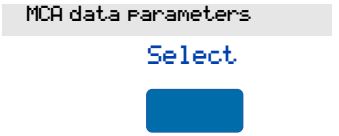
RING AGAIN PLACED

Ring Again is automatically placed.

To verify that the call is connected after Ring Again is placed:

1. Press the **Options** Key.

2. Use the up and down **Navigation** Keys to scroll to MCA data parameters.
3. Press the **Select** Key to choose MCA data parameters.



4. Use the right and left **Navigation** Keys to scroll through the MCA data parameters sublist.

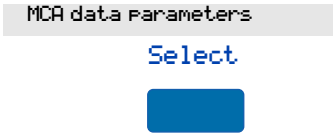
5. **Dial** the number next to the data parameter you choose. For Ring Again **Dial 64**. Check for the prompt.

Data Call Connected

This indicates that the call is established.

To cancel Ring Again:

1. *Press the **Options** Key.*



2. *Use the up and down **Navigation** Keys to locate the MCA data parameters.*
3. *Press the **Select** Key.*

4. *Use the right and left **Navigation** Keys to Scroll through the MCA data parameters sublist.*
5. *Dial the number next to the data parameter you choose. In this example **dial 39**.*

DATA RING AGAIN CANCELLED ENTER Options Key or Quit Key TO EXIT

***Note:** In this chapter, feedback from the MCA refers to what you see on the telephone Display.*

MCA Data Parameters for Keypad dialing commands

There are certain steps that are the same for each Keypad dialing command. Use the following steps prior to and after each Keypad dialing command:

To enter MCA data session:

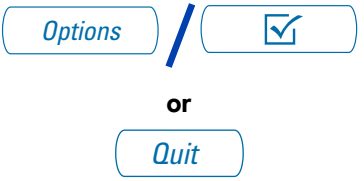
1. Press the **Options** Key.

2. Use the **Navigation** Keys to scroll to MCA Data Parameters.

Note: Once you are familiar with the Option menu item number for MCA data parameters, you can press options, the MCA data parameters number and then select the parameter you want.

3. **Dial** the number or symbol under the MCA Command number column.

To end MCA data session:

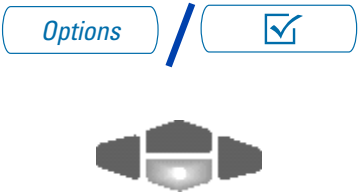


4. Press the **Options** Key to end the session.

   or

   Press the **Quit** Key to end session.

Example
To initiate a Manual Data Call:



1. Press the **Options** Key.

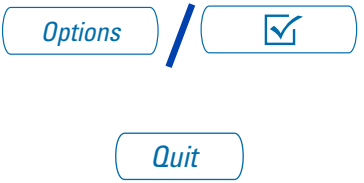
2. Use the **Navigation** Keys to scroll to and select MCA data parameters.

3. Press the **Select** Key.

4. Press the right **Navigation** Key to scroll through MCA data parameters until Manual Data Call appears in the display.

5. Press the **Select** Key.

6. **Dial** the Octothorpe Key and the far number of the far end data device.



7. Press the **Options** Key to end the MCA session.

   or

   Press the **Quit** Key to end the MCA session.

Keypad dialing commands

MCA Command number	MCA parameter	Keypad dialing notes
#	Manual Data Call	Dial # and the far end number of the data device.
*	Release Data Call	Dial *.
0 5	Language Selection	Listed as the first item in the Options Menu.
2 0	Asynchronous Mode	Dial 2 0.
2 1	Synchronous Mode	Dial 2 1.
2 2	Baud Rate	Dial 2 2. Dial the digits for the actual baud rate e.g., 19200.
2 3	Space Parity	Dial 2 3.
2 4	Odd Parity	Press Options, select MCA data parameters, dial 2 4. Press Options Key or Quit Key to end session.
2 5	Even Parity	Dial 2 5.
2 6	Mark Parity	Dial 2 6.
2 7	Host Mode	Dial 2 7.
2 8	Terminal Mode	Dial 2 8.
2 9	Hotline Off	Dial 2 9.
3 0	Hotline On	Dial 3 0.
3 1	Virtual Leased Line Off	Dial 3 1.
3 2	Virtual Leased Line On	Dial 3 2. If a power failure occurs while Virtual Leased Line is on, the MCA automatically calls back the Auto Dial number when power returns.
3 3	Forced DTR Off	Dial 3 3.
3 4	Forced DTR On	Dial 3 4. This feature is useful for sending data to a printer or for PC to PC connections where neither is configured as the Host.

MCA Command number	MCA parameter	Keypad dialing notes
3 5	Dynamic Carrier Detect Off	Dial 3 5. This feature is included for those communication software packages that require a transition of Carrier Detect from low (0) to high (1) in order to activate Answer mode.
3 6	Dynamic Carrier Detect On	Dial 3 6.
3 7	Remote Loopback Off Again	Dial 3 7.
3 8	Remote Loopback On	Dial 3 8.
3 9	Cancel Data Ring	Dial 3 9.
4 0	Full Duplex	Dial 4 0.
4 0	Full Duplex	Dial 4 0.
4 1	Half Duplex	Dial 4 1.
4 2	Modem Mode	Dial 4 2.
4 3	Network Mode	Dial 4 3.
4 4	Internal Clock	Dial 4 4.
4 5	External Clock	Dial 4 5.
4 6	PSDS Mode Off	Dial 4 6.
4 7	PSDS Mode On	Dial 4 7.
4 8	Enable Echo Canceller	Dial 4 8.
4 9	Disable Echo Canceller	Dial 4 9.
5 0	SL-1 Mode	NA
5 1	SL-1/DMS-100 Mode	Dial 5 1.
5 2		NA
5 3		NA
5 4	V.25 bis mode Off	Dial 5 4.
5 5	V.25 bis mode On	Dial 5 5. This feature allows you to answer calls automatically with DTE.
5 6	Bisync On	Dial 5 6.

MCA Command number	MCA parameter	Keypad dialing notes
5 7	HDLC On	Dial 5 7.
5 8	Assert RTS Off	Dial 5 8. When RTS is ON the MCA forces the RTS lead active and assumes the local DTE is always ready to transmit or receive data. There is no flow control.
5 9	Assert RTS On	Dial 5 9. RTS OFF allows RTS/CTS hardware flow control handshaking. The local DTE can stop the data flow by dropping the RTS lead, and the MCA drops the CTS lead. The MCA then sends a message to the far end to drop the CTS lead. When the DTE is ready, it starts the flow by raising the RTS lead. The MCA raises the CTS lead and the data transmits again. Utilizing flow control (RTS OFF) allows the MCA to operate with printers or other DTE devices that also utilities flow control.
6 0	Auto Dial Programming	Dial 6 0. Display reads: ADIAL ENTER DIGITS,
6 1	Auto Dial Call	Dial 6 1.
6 2	Data Parameter Display	Dial 6 2.
6 3	EIA leads Status Display	Dial 6 3. TXD RXD DCD DTR DSR o o • • • The display shows the status of the EIA leads of the RS-232 connected to the MCA. A dark circle indicates the lead is active. This feature is used for troubleshooting. When in synchronous mode TXD and RXD are dark. These are not used in this mode, and have no meaning.
6 4	Monitor data call	Dial 6 4. When call port is busy, the display on the telephone reads: RING AGAIN PLACED Refer to Keypad command 39 to turn Ring Again off.
6 5	Reset to Default Parameters	Dial 6 5. Unplugging the telephone does not reset MCA configuration.

MCA Command number	MCA parameter	Keypad dialing notes
6 6	Emulation selection	Dial 6 6 and use the volume control key, scroll the telephone's display until the correct modem type appears.
6 7	Lock/unlock data parameters	Dial 6 7. Even if parameters are locked, they can be changed for a call. The new parameters are used only for the active call. MCA returns to the locked parameter settings when you release the call.
6 8	VDN Key Assignment	Dial 6 8. This feature is used when your telephone is programmed to have more than one Voice DN (VDN). This assigns the VDN of your choice to originate voice calls through the MCA.

Additional asynchronous features

Autobaud

Autobaud is enabled each time you release a data call.

Each time you press **carriage return** to activate keyboard dialing or the letters **AT** to activate AT dialing, the MCA times the length of bits received and sets the baud rate accordingly.

Autoparity

The MCA automatically sets the parity each time the letters **AT** are entered for AT dialing.

In Keyboard dialing you must enter a period (.) and press **carriage return**. This is normally the first step to take when your terminal displays a garbled prompt.

Modem Pooling

When you dial a modem pool, the MCA prompts:
ENTER REMOTE NUMBER

XXXX < C>

1. Enter **number** of external modem to access and press the **Carriage Return** Key.

CALL CONNECTED.SESSION STARTS

Additional synchronous information

Use 5 5 *and* 5 7 *(HDLC On) for Group IV FAX. Use* 5 5 *and* 5 6 *(Bisync On) for video.*

When V.25 5 5) *is turned on, the MCA automatically switches to synchronous mode. When in the V.25 mode, auto answer is not available.*

If an MCA in synchronous mode calls another data module in asynchronous mode, the call is connected. You must drop the call.

Parity and character length on the MCA

In Asynchronous mode the MCA is designed to work with 8 bit data characters. You can use various parity settings, but the total character length must equal 8 bits. The MCA accepts the following character lengths and parity settings:

8 data bits, no parity bit
7 data bits + one bit of Even parity
7 data bits + one bit of Odd parity
7 data bits + one bit of Mark parity
7 data bits + one bit of Space parity
For ASCII data, 8 bits no parity equals 7 bits with space parity.

The MCA controls parity only when it displays prompts before the data call is established. In this case, the MCA outputs the prompts to the DTE with the parity settings defined with P23–P26, or it determines parity automatically with the < c > < c >. sequence.

Once the data call is established, the MCA does not check or regenerate parity. The MCA will transport the 8 bit character to the far end with the parity unchanged.

Voice call origination

By using a special cable, the MCA can communicate with two DTEs at the same time. The primary channel is the main communication channel offering MCA features. The second channel can respond to Voice Call Origination commands (VCO) only. This provides the ability to make a voice call across the second channel while simultaneously using the primary channel to transmit or receive high speed data. Below is the pinout list to connect the second channel.

	RS-232 pin	V.35 Pin
TxD	14	18
RxD	16	21
Gnd	7	7

Note: The VCO baud rate is 2400.

Asynchronous troubleshooting

If data is sent in idle mode (when there is no active call), you can not use keypad dialing. You must stop sending the data from the DTE.

You must disconnect pin 22, if you are using an RS-232 cable to connect the MCA to an ADM3/5 terminal.

If you are changing the MCA from Synchronous to asynchronous, change the baud rate before you change the mode from synchronous to asynchronous.

Some terminals drop DTR with this mode change. If this happens, the display does not show RELEASED.

Before you select VLL you must program Auto Dial.

The receiving data module always adapts to the sending data parameters. The sending data module never adapts to the answering data module parameters.

Modem pooling

Synchronous mode does not support modem pooling.

Power failure

When there is an active call between two MCAs, a power failure on either side does not disconnect the call. The call connection remains until the power returns. The MCA always retains the previous data parameters. There is no resetting required in the case of power failure.

Troubleshooting symptoms and solutions

Symptom	Solution
No response when you type <CR> or AT at the terminal.	1. Dial 2 8 to make sure you are in terminal mode. 2. Make sure your PC or terminal's power is on and you are on-line. 3. You need to connect a null modem cable between your MCA, if the equipment is not configured as DataTerminal Equipment. 4. Make sure the MCA is receiving external power. Check the power cable, make sure the connection is secure and there is power.

Symptom	Solution
	5. If you have a Display on your telephone, dial 6 3 get into EIA Monitor mode. Check to see that the MCA is receiving signals from your terminal by watching the RXD indicator on the Display while entering carriage returns on the keyboard. If the indicator flashes, the connection is correct. If not, make sure the cable connection is secure and the cable is a standard RS-232. 6. Dial 6 2 ensure that the MCA is in the Asynchronous mode). Dial 2 0 change to the Asynchronous mode. 7. Dial * to ensure that the MCA is in the idle mode. 8. If there is not a display, press 2 0 . If you hear a beep, then the MCA is in synchronous mode. Then change the baud rate 2 2 change to synchronous mode 2 0 .
The prompt: CALL CONNECTED.SESSION STARTS RELEASED	9. Check the configuration parameters of the far end data device. If they do not match those of your MCA, the call can not go through. If this happens change the parameters of your MCA to match.
Garbled prompts appear on your terminal when you type <CR>.	Enter a period (.) followed by <CR> to perform an autoparity.
You do not get response from the host computer when you try to log on.	First, release the call. Turn on Remote Loopback and make the call again. Type some characters at your terminal. If they echo back and appear on your terminal, the problem is with the far end data device. If the characters do not appear on your terminal, the problem is with the MCA. Contact your telephone system administrator.
You try to make a data call from the initial prompt (or Main menu) in keyboard dialing. You see the prompt: CALLING but no number appears and after 30 seconds you get the prompt: NO SYSTEM RESPONSE	First, hold down the break key(s) for two seconds, enter <CR> and try again to make the data call. If the problem continues, your MCA is possible disabled. Contact your system administrator.

Symptom	Solution
MCA does not operate at all.	1. Check the LED in the back of the telephone to see if it is flashing. If the LED is steadily lit, the MCA needs to be configured in your system, or the MCA is not functioning correctly. If the LED is not lit, the MCA requires external power. 2. Make sure the cable from your terminal or PC is connected to the MCA. - Check the data parameters for your display. - Make sure the transformer is plugged in, or the closet power is connected. - Make sure the cable between the MCA and your telephone is connected and is crimped.

Synchronous troubleshooting

After the call is connected send the data using bit error rate testers (BERT). If there is no transmission, or if there are excessive errors, the MCA is probably defective. Return it for repair.

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